smart water

## Wireless Tank Level System

# User Guide

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## FEATURES

- ✓ **The most advanced and the most accurate water level indicating system available!**
- ✓ **Full colour high resolution 2.8" TFT LCD touchscreen display**
- ✓ **Long range wireless connectivity with upgrade to ultra long range version**
- ✓ **Easy installation**
- ✓ **Wall mount or desk mount LCD display**
- ✓ **"One Glance" LCD display graphics designed for the ultimate in user friendly operation**
- ✓ **"Time to Empty" indication based on your actual water usage. Just like a trip computer in a car, Smart Water will tell you how long you have until your water supply will run out!**
- ✓ **Smart Water will learn and memorise your household water usage and assist you with smart solutions to your water efficiency**
- ✓ **"ALERT" features for low days remaining and low tank level**
- ✓ **Abnormal usage alert warns you of system leaks or unusual water usage. Smart Water will detect and alert you if a water outlet has been left running within 4 hours!**
- ✓ **Wireless pump control with user settable run period (on/off) and automatic stop feature**
- ✓ **Up to four water tanks can be monitored with only one LCD display unit**
- ✓ **Water can be pumped between different tanks, or alternatively from a bore water/river water source with the Smart Water wireless pump controller**
- ✓ **Wall-mount or bench-top LCD display options for full flexibility with your individual installation**
- ✓ **Solar powered tank module means minimal maintenance and zero ongoing running cost**
- ✓ **Filter replacement timer with onscreen filter replacement alert**
- ✓ **Wireless reception strength indicator**
- ✓ **Smart Water wireless range can be extended even further with an optional high performance "Yagi" antenna**
- ✓ **Automatic calibration of "full tank" (100%) level**
- ✓ **Smart Water can be customised easily to different types of water tanks, including setting an offset for where the water outlet is on your tank (true 0%)**
- ✓ **On screen graph display feature showing tank level trends over the last 30 days**
- ✓ **Super high quality construction including 316 stainless steel assemblies and ultra-high UV resistant plastics**
- ✓ **One year full replacement warranty**

# INDEX


**FEATURES** 1

**INDEX** 2

**INTRODUCTION** 3

**INSTALLATION INSTRUCTIONS** 4

- Installation Instructions 4

**MAIN SCREEN** 8

- Menu Button 9
- Status Button 9
- Tank Number 9
- Tank Percentage 10
- Tank Level 10
- Trend Indicator 10
- Tank Signal Strength 10
- Battery Low Icon 11
- Filter Replace Icon 11
- Warning Icon 11
- Pump Icon 12
- Selection Icon 12
- UP/DOWN Arrow Icons 12

**MENU SCREEN** 13

- TANK -> ADD 13
- TANK -> REMOVE 13
- TANK -> SETTINGS -> HEIGHT 13
- TANK -> SETTINGS -> FILTER 13
- TANK -> SETTINGS -> OUTFLOW 13
- PUMP -> ADD 14
- PUMP -> REMOVE 14
- PUMP -> CONTROL 14
- PUMP -> SETTINGS -> SOURCE 14
- PUMP -> SETTINGS -> DEST. 14
- PUMP -> SETTINGS -> RUNTIME 14
- SETTINGS -> OPTIONS 15
- SETTINGS -> DISPLAY -> DIM LEVEL 15
- SETTINGS -> USAGE -> RESET 15
- SETTINGS -> FACTORY -> RESTORE 15
- HISTORY 15
- UP / DOWN ARROWS 16
- CLEAN 16
- ABOUT 16

**APPENDIX** 17

- Troubleshooting 17
- Installation 17

**WARRANTY** 17

**FREQUENTLY ASKED QUESTIONS** 18

**CONTACT US** 19

## INTRODUCTION

Congratulations on purchasing the worlds most advanced wireless tank level system. Smart Water will revolutionise the way you use water and provide a superb addition to your home or farm. The system is perfect for both domestic households and rugged farm applications and has been designed to withstand the harshest environments. The product is made from the highest quality materials and is sold to you with a one year full replacement warranty.

Please take the time to read through this manual carefully. The correct installation of this product will ensure maximum performance and reliable long term operation.

The Smart Water wireless tank level system will provide basic water level indication but will also provide very detailed usage information, including an estimated “Time to Empty” and even alerts if the system detects a system leak or abnormal usage. These features will allow you to change and manage your water usage to become more economical and maximise your efficiency.

Enjoy the product and enjoy the peace of mind that Smart Water will bring to your tank water supplies.

***Thank you for purchasing Smart Water.***

## INSTALLATION INSTRUCTIONS

The Smart Water system is very simple to install. It is important that the instructions are followed step by step as illustrated below to guarantee the correct function of the product. Not following these instructions could cause the product to function incorrectly.

### ***Step 1:***

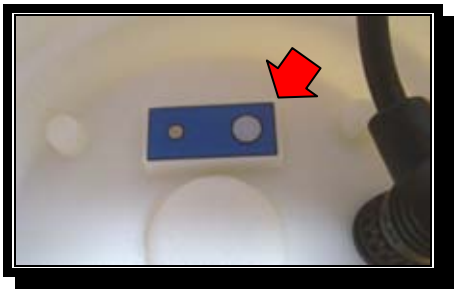
Plug in the sensor cable to the tank module. The sensor cable can be locked in position by turning the "thumb lock" on the connector. Turn the thumb lock until it clicks into the locked position.

Plug in the desk-top LCD module power supply, or wire/terminate the wall-mount LCD module power supply to a mains power source. Smart Water recommends that the wall-mount LCD module power supply is installed by a certified electrician. The desk-top LCD module can be plugged directly into any standard power outlet.

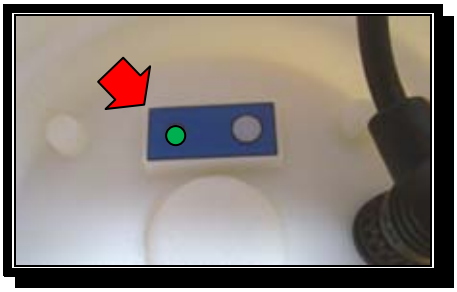
After the system initialises it will automatically show the **TANK -> ADD** menu. This menu can also be accessed manually by pressing the **MENU** button on the main screen and then **TANK -> ADD**.

**TANK -> ADD**

Once the **ADD** button is touched on the LCD screen, press and hold the circular push button on the bottom of the tank module as shown below. Once the green light next to the button is illuminated release the button:



When the tank module is connected to the Smart Water system, the light next to the button will illuminate green for 3 seconds, the LCD module will beep and the message “Tank Added” will be displayed on the LCD:



Your tank module is now connected to the LCD module. Do not put the sensor in your tank, please proceed to Step 2.

If additional tank modules need to be connected to the system (Smart Water can monitor up to four tanks) repeat the above procedure prior to proceeding to Step 2.

## ***Step 2:***

Smart Water needs to know the height of your water tank when first installed. Set the tank height of your water tank through the **MENU** screen. After touching the **MENU** button on the screen, go to the **TANK -> SETTINGS -> HEIGHT** menu.

**TANK -> SETTINGS -> HEIGHT**

The system has a default tank height of 2.4 metres; levels higher than this are detected automatically. Once your tank is 100% full the system will automatically calibrate 100% (maximum tank level) for your actual water tank depth. If you re-visit the height menu option the height shown will reflect the highest water level that your tank has reached. This may not be the number you initially entered, however this is normal operation and a good sign that the system is operating accurately and displaying a true 100% (tank full) level. If the tank height has changed do not change it back to the original setting.

If your tank height is less than 2.4M then the actual height of your water tank should be entered at the initial installation stage.

The tank height can be changed manually if required. Touch and hold down the up/down button for customized setting of the tank height.

**RECOMMENDED PROCEDURE:** *Smart Water strongly recommends to physically measure your tank height. The correct height to measure is the height from the base of the water tank to the overflow outlet. Once this height is known, reduce by around 20cm and enter the figure into the* **TANK -> SETTINGS -> HEIGHT** *menu screen. For example if your tank is 2.2M high, enter 2.0M into the* **TANK -> SETTINGS -> HEIGHT** *screen.*

**CAUTION:** *If the tank height is set too high then it is possible that the system will read incorrectly. Smart Water strongly recommends that the tank height be set slightly lower than the actual height of your tank. The system will then automatically calibrate 100% when your tank fills to its maximum level. This technique will provide the most accurate ongoing performance.*

## *Step 3:*

Take the tank module and the sensor cable to your water tank and lower the stainless steel sensor to the bottom of the tank. Please ensure that the sensor is located at the very bottom of the tank.

***Stainless Steel Tank Sensor***

**RECOMMENDED PROCEDURE:** *Smart Water recommends to physically position the sensor away from the main tank outflow pipe.*

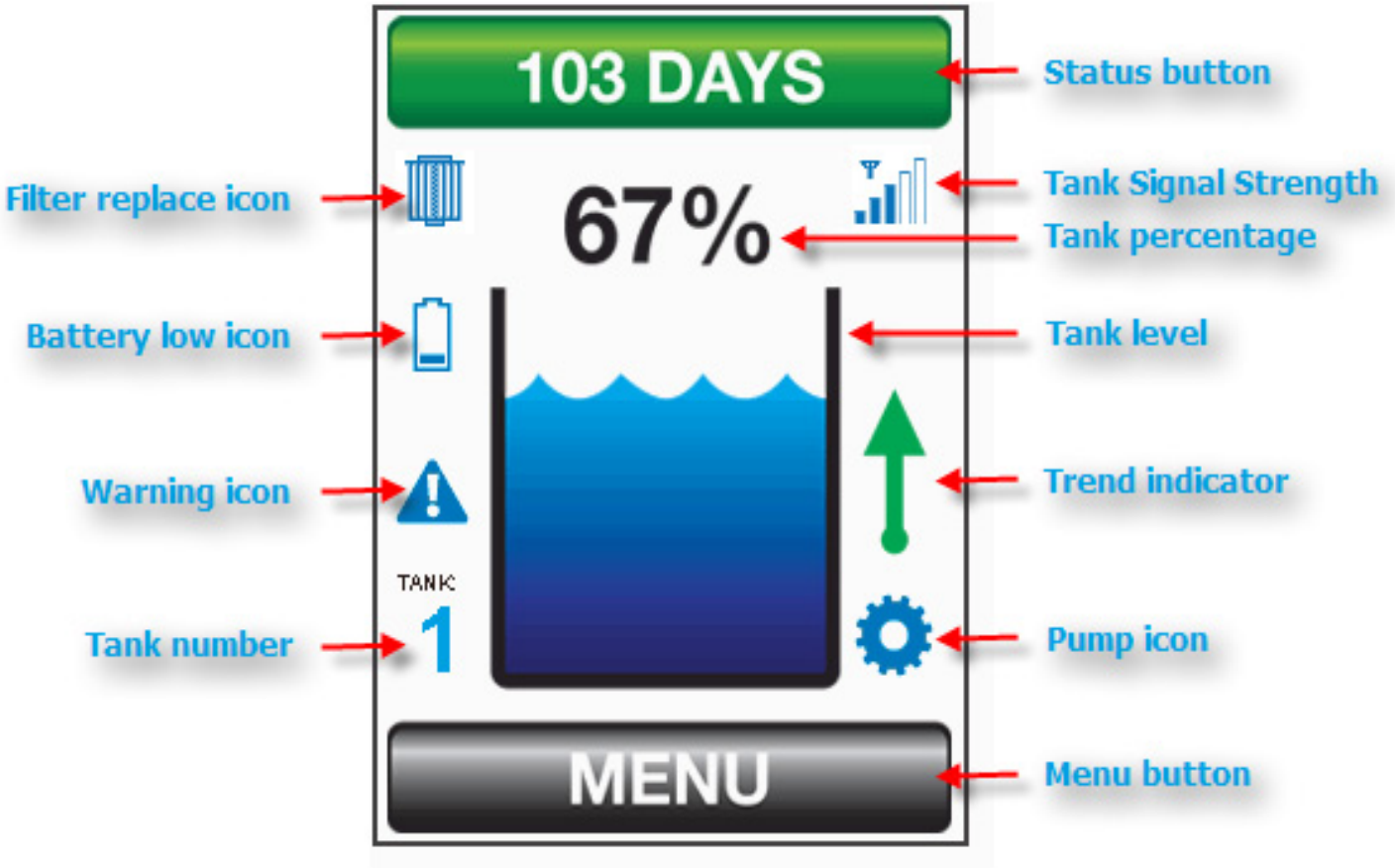
The tank module should be positioned on top of the tank for maximum exposure to sunlight. This will assist in ensuring the tank module remains fully charged.

Provided with the Smart Water product are four 10mm x 1.0" stainless steel screws. These are used to mount the tank module to the top of your water tank. The tank module does not need to be screwed to your tank but Smart Water recommends this as part of a good installation.

Attach the black antenna to the top of the tank module. The antenna should be gently screwed into position onto the gold thread located on the top of the tank module (next to the solar panel). Tighten the antenna until it is finger tight, there is no requirement to over-tighten the antenna.

***<u>Congratulations! Your Smart Water system is installed!</u>***

## MAIN SCREEN


103 DAYS
Status button
Filter replace icon
67%
Tank Signal Strength
Tank percentage
Battery low icon
Tank level
Warning icon
Trend indicator
TANK
Tank number
1
Pump icon
MENU
Menu button

## MAIN SCREEN DEFINITIONS

***Menu Button***

Touch this button to access the full set of system menus that are available.

***Status Button***

This button displays the estimated "time to empty" you have before your water supply will run out (based on your current water usage and rainfall). If for example you were getting low on water and subsequently became more efficient with your water usage, the estimated "time to empty" would increase. The maximum "time to empty" is shown as 200+ days. When Smart Water is first installed the status button will default to 200+ days, until your water usage has been learned by the system.

Touch this button to see the full system status. By touching this icon you will be taken into the system status screen. When the status button is "**green**" the status of the system is normal. The status screen will show the text "Normal Operation".

When the status button is "**red**" the system has detected an abnormal situation that should be checked. For example there could be a leak in your water tank plumbing, a toilet constantly flushing or simply a tap left on. This would cause an abnormal usage for your household and subsequently turn the status button "**red**". By pushing this button further information will be shown on the STATUS screen.

The button will also turn "**red**" when time to empty becomes critically low.

***Tank Number***

The tank number shows which water tank level is indicated on the LCD. If only one tank is connected to the system, this number will default to 1. If more than one tank is connected the tank number icon will show the number of the tank that is currently displayed. Touch the tank number to select which tank you would like displayed. It is also possible to select other tanks by pressing the tank level icon (see below). Please note that this function is only applicable if you have more than one water tank linked to the system.

***Tank Percentage***

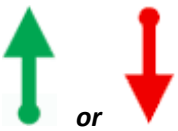
67%

This percentage figure is an accurate representation of how full your tank is referenced to the maximum recorded level of 100%. Touch the tank percentage icon on the screen to enter the **HISTORY** screen. This screen shows a graph of the tank level for the last 30 days (also see **HISTORY** in the menu section).

***Tank Level***

A simple "one glance" indication showing the current level of water in your tank. This indication represents the measured level of water in the selected tank (see "tank number"). The level will rise and fall as the level in your tank changes. Touching the tank level icon on the screen will select other tanks that are connected to your system.

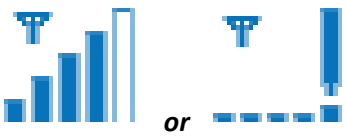
***Trend Indicators***




A simple "one glance" indication showing if the level of water in the tank is increasing or decreasing. If the trend indicator is not displayed, this means that there has been no change in tank level for the last 12 hours.

Touching and holding the **MENU** button for 2 seconds will reset the trend indicator for the currently displayed tank.

***Tank Signal Strength***




The tank signal strength indicator displays the signal strength being received from the tank module. If very low, or if no signal is shown, consider moving the tank or LCD module, or fitting an external high power antenna (available as an accessory from Smart Water).

***Battery Low Icon***

Indicates that the Li-Ion rechargeable battery in the tank module is running low. If multiple tanks are connected to the system, touch the battery low icon or the status button to display which tank has a low battery level. Make sure that the tank module solar panel is not obstructed from direct sunlight. The battery will recharge when the tank module is moved/returned to a position with access to direct sunlight.

***Filter Replace Icon***

This icon is displayed when the period of time set for filter replacement has expired. The period of time for filter replacement can be set by the user through the **TANK -> SETTINGS -> FILTER** menu screen (see page 13). To find out which tank filter needs to be replaced, touch the filter replace icon or the **STATUS** button.

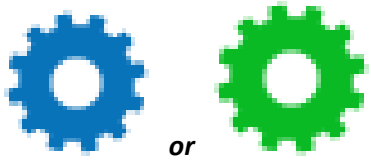
To clear the filter timer warning indication reset the appropriate tank filter timer.

***Warning Icon***

When the warning icon is displayed, there is a problem that needs to be resolved urgently. Touch the warning icon or the **STATUS** button to see what is causing the problem. Possible causes are:

- Battery too low
- Tank module unexpectedly disconnected from system

***Pump Icon***



*or*

The pump icon is displayed when a wireless pump controller has been connected to the system. A pump can be added to the system by the user through the **PUMP -> ADD** menu screen. Touch the pump icon to control the pump (also see **PUMP -> CONTROL** in the menu section).

***Selection Icons***

*or*

The selection icons confirm if a user selection is on or off. These icons are self explanatory confirming the user setting as on or off.

***UP/DOWN Arrow Icons***

*or*

Used to increase or decrease the value of the selection. If the button is pressed and held the number selection will increase or decrease at a faster rate.

## MENU SCREEN

### MENU

Touch the **MENU** button on the main screen to access the additional menus.

### TANK -> ADD

Used to connect a tank module to the system. Ensure that prior to adding a tank module the stainless steel water sensor is out of the tank and free of water. Press and hold the tank module button (on the underside of the unit) until the light is illuminated green for 3 seconds. Release the button and confirm on the LCD screen that the tank module has been added. The water sensor can be lowered into the tank after this step. Tank module installation is then complete.

### TANK -> REMOVE

Used to remove a tank module from the system. Once a tank module is removed it will need to be re-connected using the **TANK -> ADD** function. In the unlikely event that a tank module needs to be replaced, it will need to be removed first by using this process.

### TANK -> SETTINGS -> HEIGHT

A tank height above 2.4 metres is detected automatically. Once the tank is full the system will automatically calibrate 100% (maximum tank level) for your installation. Tank height can also be changed manually if required. Touch and hold down the up/down button for customized setting of tank height.

**CAUTION:** *If the tank height is set too high then it is possible that the system will read incorrectly. Smart Water strongly recommends that the tank height be set lower than the actual height of your tank. The system will then automatically calibrate 100%. This technique will provide the most accurate performance.*

### TANK -> SETTINGS -> FILTER

This useful feature will remind you when a water filter needs to be replaced. Just select the number of months and touch **SET**. The filter replace icon will be displayed when the time expires. To disable the filter timer, select 0 months and touch **SET**. Touch and hold down the up/down button for faster setting.

### TANK -> SETTINGS -> OUTFLOW

Allows the setting of the water tank outflow height. The outflow height is the height above the base of the tank where water is drawn off for supply. Water below this level is effectively unusable. By setting the outflow height Smart Water will re-calibrate the system to represent a more accurate 0% indication. The system is supplied with a default setting of 0.1m (100mm) from the base of the tank.

### PUMP -> ADD

Used to connect a pump module to the system. Press and hold the pump module button until the light is green for 3 seconds. The pump module is now added to the system.

### PUMP -> REMOVE

Used to remove a pump module connected to the system. Once a pump module is removed it will need to be re-connected using the **PUMP -> ADD** function. In the unlikely event that a pump module needs to be replaced, it will need to be removed first by using this process.

### PUMP -> CONTROL

Used to control the wireless pump controller on/off functions. Touch the **ON** button to start the pump running for the user set time period (see **PUMP -> SETTINGS -> RUNTIME**). Touch the **OFF** button to stop the pump.

If the pump source is a tank (see **PUMP -> SETTINGS -> SOURCE**), the pump will stop automatically when the source tank level is below 10 percent.

If the pump destination is a tank (see **PUMP -> SETTINGS -> DEST**), then the pump will stop automatically when the tank level is above 90 percent.

This function can also be accessed by touching the pump icon on the main screen.

### PUMP -> SETTINGS -> SOURCE

Used to set the source of the water for the pump. This can be an “unlimited” source (ie, stream water, bore water) or a “limited” source (ie, water tank). Any one of the tanks connected to the system can be used as a source.

### PUMP -> SETTINGS -> DEST.

Used to set the destination of the water from the pump. This can be an “unmonitored” destination (ie, not a tank) or any one of the tanks connected to the system

### PUMP -> SETTINGS -> RUNTIME

Used to set the maximum run time of the pump in ten minute steps (see **PUMP -> CONTROL**). Touch and hold the up/down button for fast setting.

### SETTINGS -> OPTIONS

- Display days remaining – Enables the display of the days remaining feature on the main screens status button.
- Display trend indicator – Enables the display of the trend indicator feature on the main screen (displays on the right hand side of the tank level icon).
- Enable abnormal usage alert – Enables a warning feature that alerts the user if an abnormal amount of water has been used. The alert level is calculated by Smart Water learning the standard usage for your actual installaton.

### SETTINGS -> DISPLAY -> DIM LEVEL

Used to set the brightness of the LCD display after it has automatically dimmed. If there are no buttons pressed for a period of one minute the LCD screen will automatically dim. This screen will initially show the current brightness level selected for the dim mode. Dim level brightness can be adjusted by touching the up and down buttons. The brightness will adjust accordingly up and down. If the brightness is set to 100% the display will not dim after one minute. For all other brightness settings the screen will dim to the user set brightness after one minute.

### SETTINGS -> USAGE -> RESET

Used to reset the historical usage for a tank which is stored in the memory. Should a tank have an abnormal usage that leaves it showing an unusual days remaining result, then this function can be used to clear the usage back to display 200+ days. The Smart Water system will automatically begin to re-calculate days remaining once usage data has been accumulated and stored into memory. Deleting the history cannot be reversed, so take care in using this function.

### SETTINGS -> FACTORY -> RESTORE

Used to restore the LCD keypad to the factory default settings.

**CAUTION:** *All tank modules connected to the system will be lost and will need to be re-connected to the system. The tank sensors must be completely removed from the tank, as per the tank module connection procedure* (**TANK -> ADD**).

### HISTORY

This function displays the water level in the selected tank for the last 30 days in a graph format. Touch the graph to see any additional tanks connected to the system. This screen can also be accessed easily by simply touching the tank percentage symbol on the main screen.

**UP/DOWN ARROWS**

Used to increase or decrease the value of the selection. If the button is pressed and held the number selection will increase or decrease at a faster rate.

**CLEAN**

Allows the touchscreen LCD display surface to be cleaned. It is best to clean the screen with a soft damp cloth. The touchscreen "touch" function is disabled during this time to prevent unwanted button inputs. The screen clean mode will cancel in 30 seconds and normal touchscreen function will be restored. A count-down timer is displayed during this period for your convenience.

**ABOUT**

Displays the Smart Water logo and the software version number.

# APPENDIX

## Installation

- Ensure there are no large metal objects between the keypad and the tank module antenna. This will assist with optimum wireless performance
- Ensure that the tank module is in direct sunlight
- The water sensor should be free of water and not submerged when initially linked to the system
- Position the sensor on the bottom of the tank away from the water outlet pipe
- For the best wireless performance of the wall mount unit position the antenna vertically away from the circuit board module and away from the power transformer and AC wiring
- Smart Water recommends the LCD wall mount unit should be installed by a qualified electrician

## Operation

- Increased tank level communication rate can be activated by momentarily pressing the tank module button. Tank level update communications will be increased for a period of 30 minutes. Tank level updates are transmitted when the green LED flashes momentarily every 10 seconds
- If a red flashing light is noted on the tank module please contact Smart Water. Refer to the last page of this user manual for contact details
- Ensure that the sensor once lowered into tank is resting at the bottom of the tank, away from the main water outlet
- The tank module can be powered down/turned off by unplugging the sensor cable
- If using the extended range Yagi antenna, it should be positioned so as to point towards the direction of the LCD receiver unit. This will assist in maximising range

# WARRANTY

Smart Water provides a full one year workmanship warranty on its products. The Smart Water one year full replacement warranty is void if the product has been tampered with, opened or damaged outside the range of normal use.

Full details of the warranty are available at www.smartwatertech.co.nz

## FREQUENTLY ASKED QUESTIONS

- What is the maximum wireless range of the Smart Water system?
  - *2.5km is standard, up to 5km with the optional extended range antenna*
- Do I need to change the batteries in the tank module?
  - *No. The batteries are continuously recharged by the solar panel. The tank unit will continue to operate for up to 3 months without direct sunlight.*
- What is the maximum tank depth the system will work with?
  - *5.0M is the standard maximum depth. However custom depths systems are available. Please contact Smart Water for more information.*
- Will the wall mount unit fit into a standard flush box?
  - *The Smart Water wall mount unit is designed to fit easily into any standard Clipsal or PDL flush box. Mounting accessories are provided with your starter pack. Alternatively a **50mm** hole can be made and the wall mount unit can be mounted directly onto the wall surface.*
- Can Smart Water measure water from more than one tank?
  - *Yes. Up to four tanks can be monitored from one LCD unit. Each tank will need a tank unit installed. Please refer to the user manual for adding additional tanks to the system.*
- Will reception be reduced if trees or walls are in between the tank and the LCD unit?
  - *Any wireless system will have range/reception reduced by obstacles. Similar to the poor reception of radio stations in valleys. Smart Water recommends minimising obstructions in the direct path of the wireless signal.*
- Will the battery in the tank unit run flat if it is cloudy?
  - *No. The battery will re-charge at a slower rate in cloudy conditions but it will not run flat. Exposure to direct sunlight is of course recommended for maximum charging performance.*
- Can I install the unit myself?
  - *Yes. The Smart Water system is designed to be very easy to install. No technical skills are required. Smart Water does recommend reading this user manual prior to starting any installation. As with any domestic electrical outlet, the wall mount LCD unit should be installed by a qualified electrician.*
- What happens if there is a power cut or the power to the LCD is interrupted?
  - *Nothing. Once power is restored the LCD unit will communicate with your tank and previous readings/data will be restored to the screen automatically.*
- How long does Smart Water take to learn my water usage?
  - *Smart Water will start storing and calculating your water usage from the moment you plug it in. The longer the system is running the more intuitive and "smart" the system will become.*
- When will Smart Water detect a water leak in my system?
  - *Smart Water will provide a user alert for abnormal usage after 4 hours.*
- Does the tank unit need to be installed horizontally on the tank?
  - *No, the tank unit can be installed on any angle.*

# CONTACT DETAILS

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